ATOMIC ENERGY newsletter

FIVE HUNDRED NINE FIFTH AVENUE NEW YORK 17, N.Y.

A SERVICE FOR INDUSTRY-BUSINESS-ENGINEERING AND RESEARCH

December 20th, 1949.
Vol. 2...No. 9

Dear Sir:

Potential industrial uses of processes and methods developed in U. S. atomic work are among a group of 57 reports recently issued by the U. S. Atomic Energy Commission. Included are: detecting leaks in industrial chemical processing systems, a low cost production method for industrial fluorine, redeterminations of two basic properties of carbon, and the effect of low dosages of radiation upon the blood count of exposed atomic energy workers. (See page 5, this LETTER, for these and other new publications.)

An analytical balance with a small radioactive source mounted on the beam, so that any beam movement registers as an unbalance in the two halves of a split ionization chamber (Seederer-Kohlbusch Microbalance)--will be among nuclear devices displayed at the 116th meeting in New York, Dec. 26-31, of the American Association for the Advancement of Science. (See page 3, this LETTER, for other news of nuclear products.)

An analysis of 21 contracts awarded to date by the AEC at the Nuclear Reactor Testing Station (Arco, Idaho), shows that only two have gone to non-western firms: Blaw-Knox Construction Co., Pittsburgh, for design of the materials testing reactor (AEN 9/13/49), and Aero Service Corp., Philadelphia, for aerial surveys of the site (AEN 11/8/49). In denying that western contractors are being favored, the AEC points out that since two-thirds of the work is on a competitive bid basis, western firms have the advantage of being closest to the jobs. For cost-plus-fixed-fee construction at Arco (example: Bechtel Corp. $2,500,000.00 experimental breeder reactor job-AEN 12/6/49), as many as 159 firms have been considered for one contract. All things being equal (the AEC has stated) the firm with the greatest experience in the Mountain states is selected. (See page 2, this LETTER, for activities at Arco and other atomic centers and cities.)

The "homogenous reactor", a new kind of nuclear reactor, was described last week by Dr. L. R. Hafstad, AEC director of reactor development, at the 3-day conference of the AEC at Argonne National Laboratory, Chicago. So far, he said, all reactors used fuel elements embedded in other materials for cooling, reflecting, and moderating. With the homogenous reactor, these constituents would be mixed together uniformly. It is the simplest and most efficient atomic power plant conceivable now (he said), and is regarded by leaders in the field as the atomic power plant of the future...A suitable heat exchanger for transferring heat generated in a nuclear reactor, for possible industrial power purposes, is in an advanced stage of development by the AEC, this meeting was also told. David E. Lilienthal, AEC Chairman, said important progress toward such a heat transfer agent had been made.

Using a uranium compound as a photo-catalyst, in a photo-chemical dyeing process developed by the Vat-Craft Corporation, New York, the Shamrock Textile Processing Co., Paterson, recently demonstrated a new system of high speed fabric dyeing. Greater speed and efficiency are claimed for the new process.

Published bi-weekly by Atomic Energy News, Inc., 509 Fifth Avenue, New York 17, N. Y. Copyright, 1949, Atomic Energy News, Inc. All rights reserved.

AT THE ATOMIC CITIES AND CENTERS IN THE UNITED STATES...

ARCO, Idaho- A chemical separation plant, for nuclear fuel recovery and decontamination, is now under consideration for the Nuclear Reactor Testing Station here. It will be a complex and versatile plant, embodying ideas developed in the Knolls Atomic Power Laboratory, Schenectady, the Argonne National Laboratory, Chicago, and Oak Ridge National Laboratory. A Processing Advisory Committee, for the chemical and metallurgical problems involved in this operation, has just been appointed. Dr. F. W. Schumacher, Standard Oil Development Co.; Dr. S. Lawroski, of Argonne; Dr. J. Marsden, of Knolls; and Dr. Culler, of Oak Ridge, will serve on the Committee.

The multi-purpose nuclear program here--production of fissionable material, production of power, and propulsion of ships and aircraft--is gradually picking up momentum, with the four nuclear reactors for these purposes now in various planning and/or construction stages. Several million dollars in contracts will be let here during the remainder of the fiscal year, which ends next July 1st. They will be in comparatively small jobs, of about one hundred thousand dollars each. To date, on-site work totaling some $3,000,000.00 has been initiated. This includes power lines, water lines, concrete batch plant, and other work.

OAK RIDGE, Tennessee- Protesting employment of some non-union workers by Oman Construction Co., who are laying the main natural gas line into the Oak Ridge area (AEN 11/22/49), approximately 3,000 workers at various construction jobs here walked out in a four day wildcat strike last week, at Oak Ridge. First actual walkout to affect major Oak Ridge operations, settlement was made after intervention by the National Labor Relations Board; the President's Atomic Energy Labor Relations Panel was getting ready to act. It was not needed.

Projects delayed by the 4-day strike included the new K-29, $66,649,000.00 uranium-235 production plant (AEN 9/13/49), on which grading and preliminary work have been completed. Concrete placement has been accomplished for some of the plant, and erection of steel is expected to begin immediately. Maxon Construction Co., Dayton, the prime contractor on K-29, now has approximately 1,650 people employed on this job.

RICHLAND, Washington- Terming the government of Richland a "benevolent dictatorship", David McDonald, Mayor of Richland, has charged that the officially stated intent of the AEC to increase self government in atomic towns is being violated in Richland. The Community Council (Richland's local representative body) has also complained that it has been ignored in village matters. (At issue, is Richland's unique status as a "company town". Located on the atomic project reservation, actual operation is delegated to General Electric Co., under its Hanford plutonium project contract with the AEC.)

SANDIA BASE, Albuquerque, New Mexico- This atomic bomb engineering center--shared by the Armed Forces' Special Weapons Project, and the AEC--now has a nearby military adjunct. Kirtland Air Force Base, near Albuquerque, which since 1946 has seen activity in the U. S. Air Force's atomic work, has now been designated Field Office of the Air Force's Special Weapons Command. It will deal with atomic weapons solely from an aviation view-point, and work closely with Keesler Air Force Base, Mississippi, another Air Force atomic center.

GREAT BRITAIN

Work has been suspended on the building of Britain's third atomic pile at Windscale Works, Sellafield. The Ministry of Supply, in charge of British nuclear work, has now stated that "on review of the (atomic) program, and in light of possible developments in the near future, it has been decided to suspend work on the third pile." New developments in the field of applied nuclear physics were thought by British observers to be an influencing factor; at Harwell, the Atomic Energy Research Establishment, a 180 Mev cyclotron has now been completed and placed in use. Largest in Great Britain, and in Europe, the cyclotron had been under construction for three years.

PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

Nuclear product and instrument manufacturers who will display at the 116th meeting of the American Association for the Advancement of Science in New York, Dec. 26-31st, include Cambridge Instrument Co., N. Y., showing their precision ionization meter (Failla Design); "Chang and Eng" fast neutron detector; Lindemann-Ryerson electrometer; and pocket gamma ray dosimeter--Canadian Radium and Uranium Corp., N. Y., showing (in addition to their Seederer-Kohlbusch micro-balance, page 1, this LETTER), their Telicon, an instrument by means of which radiation fields may be viewed in relation to their sources and other nearby objects--Central Scientific Co., Chicago, showing a new laboratory model radiation meter (made for them by Tracerlab, Inc.)--Nuclear Instrument and Chemical Co., Chicago, showing a complete line of instruments for radioactivity measurement and research--Nucleonic Corporation of America, Brooklyn, N. Y., showing their model RC-1, & RC-1B count rate meters; model RM1 survey meter for alpha, beta, and gamma radiation; and Geiger tubes with other accessories--Tracerlab, Inc., Boston, showing basic instruments for a radioactivity laboratory, including their Autoscaler, "64" scaler, their new "100" scaler, as well as Geiger tubes and other equipment.

A primary neutron standard, making it possible for all laboratories to measure neutron intensities in terms of a common reference value, has been developed by the National Bureau of Standards, Washington. It consists of a solid beryllium sphere, 4-cm. in diameter, enclosing a capsule of radium. A duplicate standard is available from the Bureau for loan to other research laboratories.

FROM THE MANUFACTURERS- Fume hood for handling radioactive isotopes, model #3600 (Oak Ridge Institute of Nuclear Studies approved). Steel construction throughout, entire interior constructed of stainless steel. Working surface (stainless steel) will support load of 4,600 pounds. New system of airfoils, baffles, and ducts provides evacuation of gases at low velocities, without eddies or turbulence--Kewaunee Manufacturing Co., Adrian, Mich.

Model SU-7 radioactive ore detector. For field use; manufacturer states it is unaffected by humidity or moisture; long-life batteries will last for approx. one year (except for "A" battery, which is a standard flashlight cell). Equipped with earphones; web belt for carrying.--Tracerlab, Inc., Boston, Mass.

Count rate meter, RCA Type EMA-6. Self contained, 115-volt, 60-cycle operation. Indicating meter, calibrated in units of ten, indicates full-scale counting rates of 10, 100, or 1,000 counts. For use with any type of radiation detector; supplies 0-2500 volts (filtered d-c), which can be varied by panel mounted potentiometer.--Radio Corp. of America, Camden, N. J.

Long probe gamma survey meter. For any type of radiation monitoring. Radiation detector tube mounted in end of four-foot long probe. Battery powered.--General Electric Co., Schenectady, N. Y.

ATOMIC PATENT DIGEST...latest U. S. & British applications & grants...

Radioactive ink, preferably prepared from radioactive elements which are essentially beta emitters, as: barium-140, strontium-89, bromine-83, etc., and particularly their carbonates, chlorides, or sulphates. In one example, about 25 micrograms of the chloride of radioactive barium (300 hour half-life), containing about 100 millicuries of activity, are dissolved in 100 c.c. of water. Pat. application no. 526,338, made by E. Segre, to the U. S. Pat. Off., and assigned to the U. S. of America (Atomic Energy Commission).

Current integrating network, comprising gaseous discharge tubes, in associated circuit. U. S. Pat. No. 2,487,510, issued Nov. 8th, 1949, to W. R. Baker, and assigned to United States of America (Atomic Energy Commission).

Non-contacting thickness gauge ("beta gauge"). Comprises a source and a detector of sub-atomic particles, with the source so positioned that a beam of the particles is directed through the material being measured. U. S. Pat. No. 2,488,269, issued Nov. 15th, 1949, and assigned to General Electric Co.

IONIZING RADIATION...investigations & notes...

Aureomycin was given in the diet to 600 rats and 8 dogs after exposure to lethal doses of X-rays. It prolonged their lives 5-7 days. J. W. Howland, F. Furth, L. R. Bennett, M. Coulter, and G. M. McDonnell, of the University of Rochester, who did this work, also gave aureomycin (orally) to a human patient with radiation sickness. The patient had received 16 days of intensive irradiation for a malignant tumor of the liver. A definite subsistence of radiation sickness occurred within 48 hours. Animals given aureomycin 6 days after irradiation also showed response to treatment.

Investigations of neutron and roentgen-ray effects on the protein content of rat intestine have been made by M. H. Ross, and J. O. Ely, of the Biochemical Research Foundation, Newark, Delaware. It was found that total body neutron and roentgen irradiation of rats caused a reduction in the amounts of tyrosine, tryptophane, arginine, and nitrogen, which are important constituents of protein. In the work, the tyrosine and tryptophane content was markedly decreased 24 hours after 600 r total body roentgen irradiation. While no significant change occurred in these constituents 24 hours after 56 n total body neutron irradiation, a considerable decrease in the tyrosine and tryptophane content was found 24 hours after 100 n, or 200 n, total body neutron irradiation. The arginine content was found to decrease 24 hours after 600 r, or 200 n, total body irradiation.

Observations of the loss of hair from the skull have been made by C. Gefferth, at the Children's Clinic, University of Budapest, who has treated feeble-minded children by irradiation of the brain. Using 60 to 90 r, with hard rays, four or five areas of the skull were irradiated daily, or on alternate days. The second series of irradiations followed six weeks later, and the third after three months Extensive loss of hair could be observed in some instances, although the doses administered were far below those used for epilation. One child, suffering from cervical lymphadenitis, lost his hair (temporarily) although no rays fell directly on the head. He received 260 r on the right, and 285 r on the left side of the neck, with the central rays directed to the angle of the jaw. Some weeks later, hydrocephalus developed. Gefferth feels that the cause of the loss of hair might have been in the organism itself, certain characteristics being activated by the irradiation, or it might have been due to disturbed hormonal equilibrium.

Use of the 3 Mev beam from a Van de Graaff machine to sterilize pharmaceuticals has been reported at Massachusetts Institute of Technology. The process, developed at MIT, has enabled penicillin, streptomycin, surgical sutures, anti-coagulants (such as heparin), and many other substances to be sterilized in their final glass containers without detectable adverse effect on their potency or other properties. Completely bacterial and virus contaminants, in many heat sensitive drugs, have been destroyed using the 3 Mev beam.

RADIOISOTOPES...applications

The use of di-iodo-fluorescein (radiofluorescein) to detect intracranial tumors has recently been described by M. Ashkenazy, G. V. LeRoy, T. Fields, and L. Davis, in work at the Radioisotope Unit, Hines Hospital (VA), Chicago. Since neoplastic tissues have the ability to combine (temporarily) with fluorescein dye, when radiofluorescein in amounts of 0.7 to 1.0 mc. is used, the greater radioactivity of the tumor tissue enables its location by Geiger-Muller counter. The technique has been applied to the diagnostic study of patients with space-filling intracranial lesions. When the lesion is a neoplasm, good concentration of the radiofluorescein occurs; when the lesion is a non-neoplastic cyst, or hematoma, there is no significant local accumulation of the radioactive material. The investigators report that, in 60 patients examined with this technique, in every instance but one, the diagnosis based on the isotope studies has been verified at operation.

RAW MATERIALS...for nuclear processes...

UNITED STATES- The Camp Bird mine, in South Temple, Utah, is now being worked for its uranium ore by V. W. Faucett, lessee. The mine is one of a group in this area that has been dormant for over a decade...In the Colorado Plateau area, where, so far, the only important U. S. deposits of uranium ore have been located, the U. S. Geological Survey, working on behalf of the AEC, is conducting an intense exploratory campaign. From 1947, to September 1949, Government drilling totaled approximately 285,000 feet. For the future, plans call for drilling at the rate of about 400,000 feet per year, with half the work supervised by the U. S. Geological Survey; the remainder will be by the AEC direct. To avoid speculative staking, the right of mineral entry is withdrawn from the areas under exploration. Lands found to contain uranium minerals are leased to private interests by the Government.

AUSTRALIA- Although samarskite (uranium mineral giving 9-18% uranium oxide), was found in mica workings at Lone Pine, in the Hartz range (AEN 6/21/49), exploration showed it to occur in small, widely scattered pipes; it is not commercially workable. However, the Australian Government is paying £250 Australian to the shareholders in the lease who first reported the find.

BRAZIL- An extensive deposit of uranium-bearing minerals has been discovered at San Joao del Rei, near the British gold mines in the Minas Geraces. The finds have been reported to the National Security Council, and geologists from the Department of Mineral Production are now in the area to investigate. Assays have not yet been returned. Another discovery of uranium minerals had been previously reported from the Conquista district of Bahia. The find, which was made by an Italian dentist, who had only recently arrived in Brazil, has not as yet been officially confirmed.

Contracts to export 2,000 tons of monazite sand have been issued here this year, up to Sept. 1st, with 1,615 tons shipped. Source of the monazite are the beds of monazite sands which extend along the coast of Rio de Janeiro, Espirito Santo, and Bahia, and which are worked by miners registered in accordance with the Code of Mines. Prospecting, mining, and export are controlled by the Department of Mineral Production, and shipping contracts are submitted in advance to the National Security Council for approval. In addition, samples of all consignments for abroad are analysed and shipments are supervised by the Superintendent of Strategic Minerals.

BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Reports (declassified and unclassified), of the laboratories of the AEC, as issued for November, 1949. These reports, which include potential industrial applications, cover such fields as: Biology & Medicine, 9 reports; Chemistry, 18 reports; Engineering, 14 reports; Mineralogy, Metallurgy, and Ceramics, 5 reports; and Physics, 11 reports.--Document Sales Agency, AEC, Box E, Oak Ridge, Tenn.

Isotopes price list. Cyclotron and large amounts of fission product isotopes, supplement no. 2, December, 1949.--Isotopes Division, AEC. Oak Ridge, Tenn.

Safe Handling of Radioactive Isotopes. National Bureau of Standards, Handbook No. 42. Prepared by the sub-committee on the handling of radioactive isotopes and fission products. (15¢)--Superintendent of Documents, Wash. 25, D.C.

Concrete as a Protective Barrier for Gamma Rays from Radium, by Wyckoff & Kennedy. National Bureau of Standards research paper no. 1938. (10¢)--Superintendent of Documents, Wash. 25, D.C.

Atomic Energy and Society, by James S. Allen. Control of atomic energy in the United States. ($1.25)--International Publishers Co., New York.

Nuclear Physics and Cosmic Rays, Parts I & II (in German) by W. Bothe, S. Flugge, and others. Part I, 230 pages; Part II, 198 pages. Part of the F. I. A. T. "Review of German Science, 1939-1946"--Germany, Office of Military Government for Germany, Field Information Agency, Technical.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

December 20th, 1949.